

Calibration Report: Multifilter Rotating Shadowband Radiometer, MFR-7, s/n 378

2001 November 31

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SUMMARY

Calibration date: 2001 November 31 Next calibration due: 2003 November 31

An analysis of clear sky data from a multifilter shadowband radiometer has been completed. A Harrison Objective Algorithm-Langley Analysis was applied to the data sets. The regressed values (V_o) are top-of-atmosphere voltages, corrected for Earth-sun distance for each of the 5 sensor channels. Each of these factors is a mean of several regression periods. Also included are the 95% uncertainty bounds (U95). These data were collected at Mauna Loa Observatory, Hawai'i during September and October of 2001.

Serial Number: MFR-7 378

| Channel, nm | V_o | n | U95% |
|-------------|----------|----|------|
| 416 | 9639.26 | 3 | 2.39 |
| 497 | 6443.41 | 20 | 1.51 |
| 613 | 5993.12 | 12 | 1.38 |
| 672 | 10923.11 | 7 | 1.47 |
| 868 | 9870.23 | 3 | 2.16 |

V_o = Intercept from regression
data to the regression line of the $\ln(\text{voltage output})$.
n = The number of morning Langley Regressions.

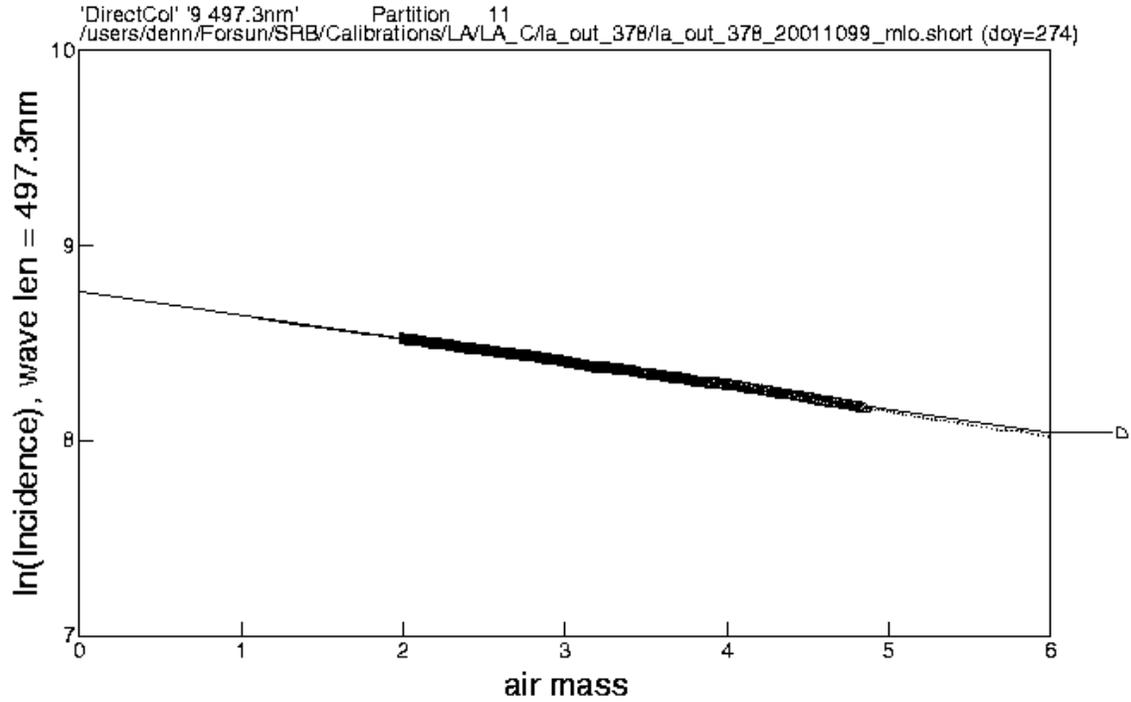
PLOTS

A sample Langley Regression plot for 497 nm on the October 6 is included as plot 1. Time series plots are included for each of the 5 wavelengths as plots 2 through 6.

'LSfitSD' '0.18'
'OutLimit' '3.0'
'FracPle' '1.20'

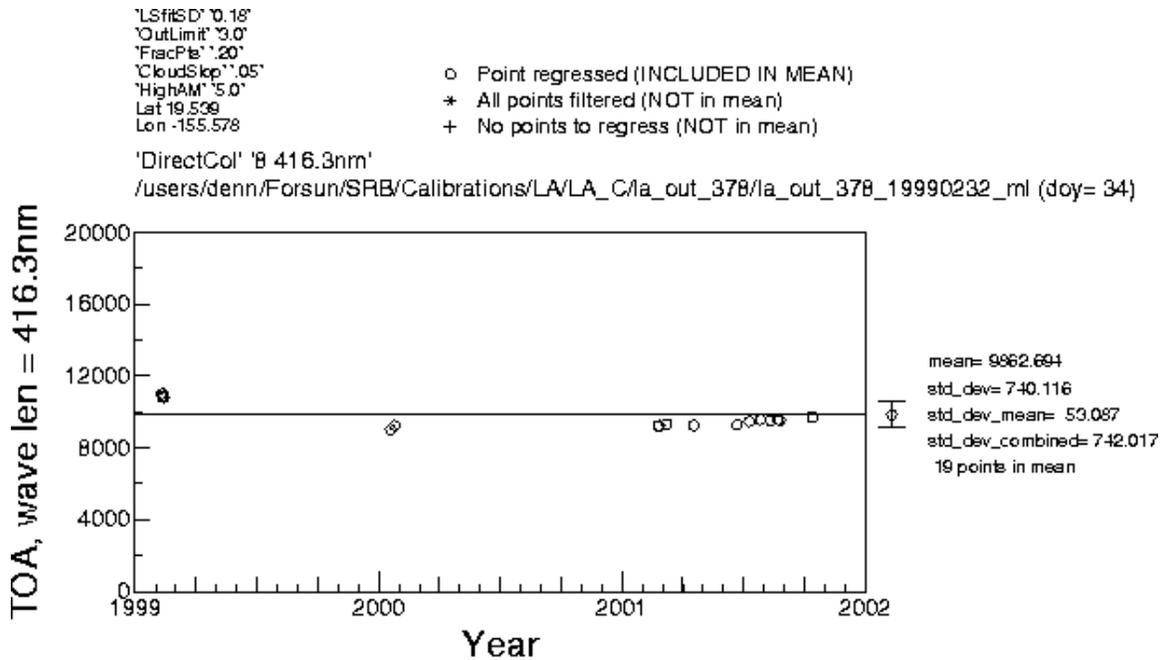
'HighAM' '5.0'
Lat 19.539
Lon -155.578

☐ IO= 6097.02, IO_norm= 6090.63, OD= 0.12094, ad_fit= 0.00304 doy=279 286.027/1278

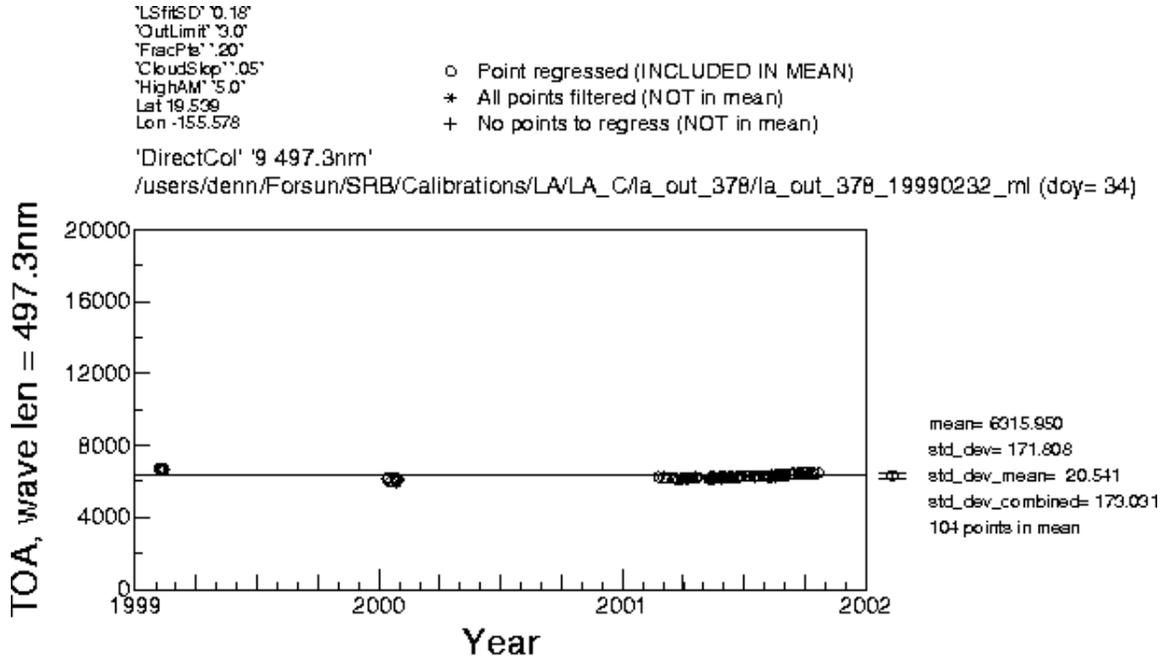


Nov 16 12:05:39 2001
/home/denn/Forsun/SRB/Calibrations/LA/Langley_plot

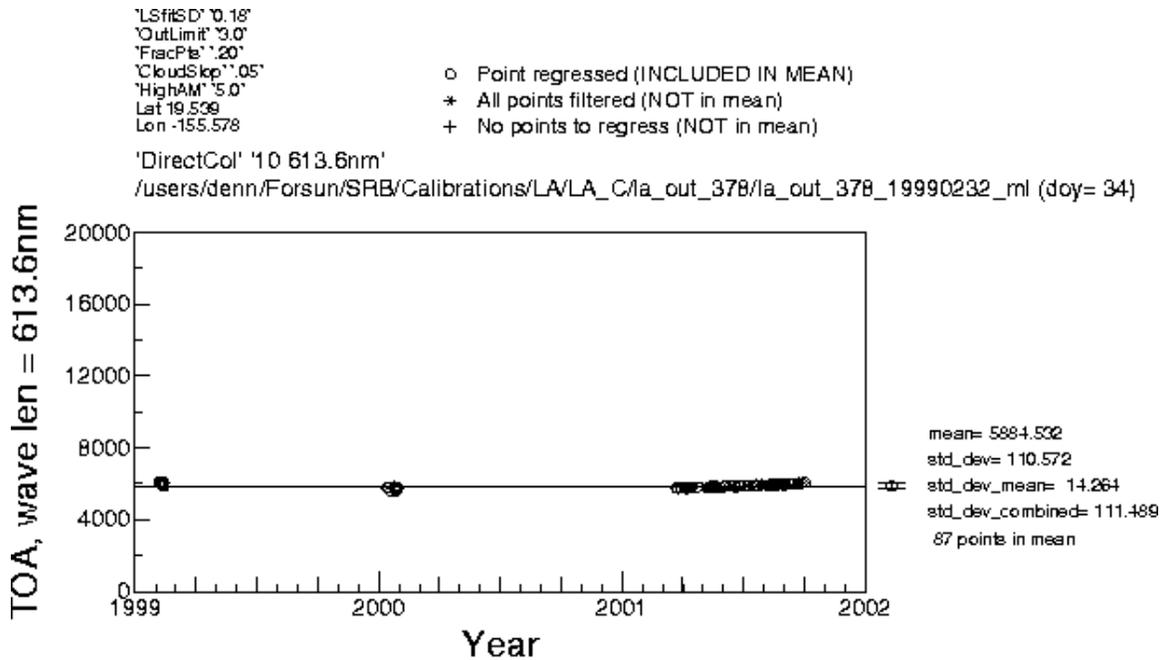
Plot 1. An example of a Langley regression plot. Air masses 2 through 5 are used and an extrapolation the top of atmosphere irradiance value (V_0), at air mass zero is determined. This plot is for 2001 October 6.



Nov 15 11:20:40 2001
/home/denn/Forsun/SRB/Calibrations/LA/VO_vs_time_plot
Plot 2. Time History of Vo for the 416.3 nm channel during 1999, 2000, and 2001.

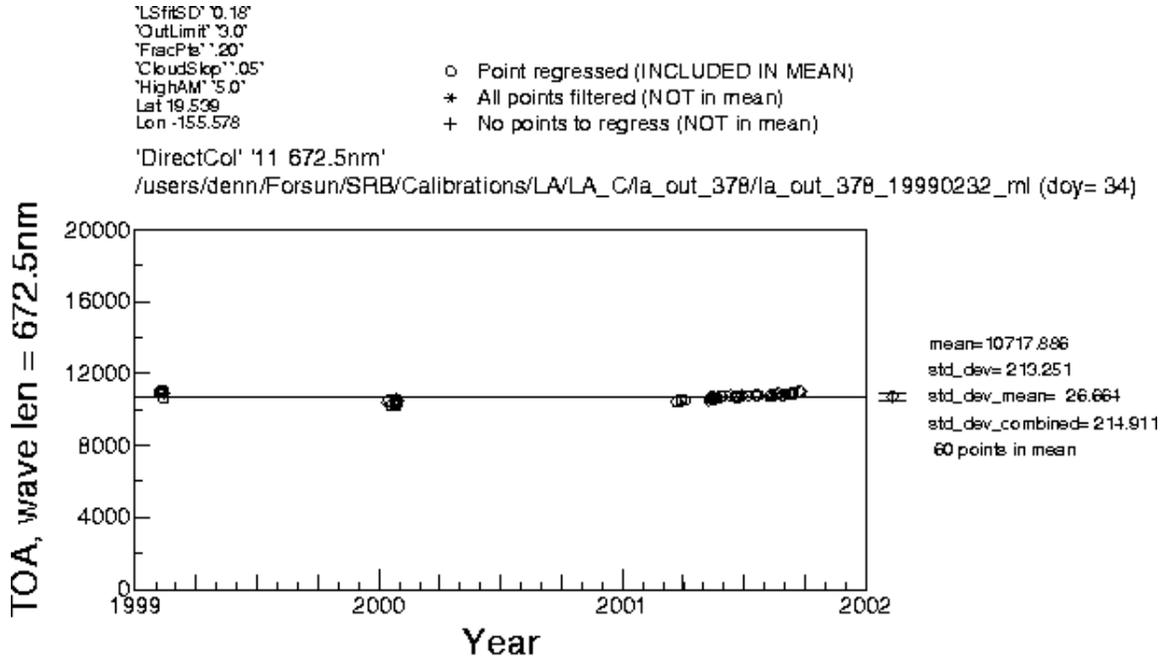


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/home/denn/Forsun/SRB/Calibrations/LA/VO_vs_time_plot
Plot 3. Time History of Vo for the 497.3 nm channel during 1999, 2000, and 2001.



Nov 15 11:20:40 2001
/home/denn/Forsun/SRB/Calibrations/LA/VO_vs_time_plot

Plot 4. Time History of Vo for the 613.6 nm channel during 1999, 2000, and 2001.



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Plot 5. Time History of Vo for the 672.5 nm channel during 1999, 2000, and 2001.

